

## Groundwater Application Review Summary Form

Application # G- 18701

GW Reviewer Travis Brown and Dennis Orlewski Date Review Completed: 12/11/18

### Summary of GW Availability and Injury Review:

Groundwater for the proposed use is either over appropriated, will not likely be available in the amounts requested without injury to prior water rights, OR will not likely be available within the capacity of the groundwater resource per Section B of the attached review form.

### Summary of Potential for Substantial Interference Review:

There is the potential for substantial interference per Section C of the attached review form.

### Summary of Well Construction Assessment:

The well does not appear to meet current well construction standards per Section D of the attached review form. Route through Well Construction and Compliance Section.

*This is only a summary. Documentation is attached and should be read thoroughly to understand the basis for determinations and for conditions that may be necessary for a permit (if one is issued).*







PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date 12/11/2018  
 FROM: Groundwater Section Travis Brown, Dennis Orłowski  
 SUBJECT: Application G- 18701 Supersedes review of \_\_\_\_\_  
 Reviewer's Name  
 Date of Review(s)

**PUBLIC INTEREST PRESUMPTION; GROUNDWATER**

**OAR 690-310-130 (1)** The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525. Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.**

**A. GENERAL INFORMATION:**

Applicant's Name(s): Dolores & Randolph Wells, Stacey T. Harrison, Cicily Thrush, and Calypso Traudt County: Marion

A1. Applicant(s) seek(s) 0.379<sup>a</sup> cfs from 1 well(s) in the Willamette Basin,  
Pudding River subbasin

A2. Proposed use Irrigation / Nursery Seasonality: March 1 – October 31

A3. Well and aquifer data (**attach and number logs for existing wells; mark proposed wells as such under logid**):

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	<del>N/A</del> <u>Proposed</u>	1	Alluvium	0.379 <sup>a</sup>	6S/2W-2 SE-SW	270' N, 2355' E fr SW cor S 2

\* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	183 <sup>b</sup>		~20-45 <sup>c</sup>	N/A	300 <sup>d</sup>	0-50 <sup>d</sup>	0-300 <sup>d</sup>		TBD <sup>d</sup>	170 <sup>d</sup>	Unknown	N/A

Use data from application for proposed wells.

A4. **Comments:** The proposed POA/POU is located in the Pudding River basin approximately 2.5 miles south of the City of Gervais, Oregon.

<sup>a</sup> In Application Section 3: Well Development, Applicant listed "Total maximum rate requested" as 0.375 cfs (168.3 gpm); however, the Applicant entered a "WELL SPECIFIC RATE (GPM)" of 170 gpm (~0.379 cfs) for Well 1 in the applicable column of the second table of Section 3. Therefore, to provide a conservative analysis, this review will apply the greater rate of 0.379 cfs (170 gpm) to assess groundwater availability and potential impacts from pumping.

<sup>b</sup> Land surface elevation at proposed well location (WatershedSciences, 2009; USGS, 2013).

<sup>c</sup> Depth to static water level estimated from estimated land surface elevation and regional water level elevation contours (Woodward et al, 1998).

<sup>d</sup> Values for the proposed well from the application.

A5.  **Provisions of the** Willamette Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water  **are**, or  **are not**, activated by this application. (Not all basin rules contain such provisions.)

Comments: The proposed POA is greater than 1/4-mile from the nearest perennial stream and will produce groundwater from a confined aquifer; therefore, per OAR 690-502-0240, the relevant Willamette Basin (OAR 690-502-0040) rules do not apply

A6.  **Well(s) #** \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, tap(s) an aquifer limited by an administrative restriction.  
 Name of administrative area: Not Applicable  
 Comments: \_\_\_\_\_

**B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070**

B1. **Based upon available data**, I have determined that groundwater\* for the proposed use:

- a.  is over appropriated,  is not over appropriated, or  cannot be determined to be over appropriated during any period of the proposed use. \* This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;
- b.  will not or  will likely be available in the amounts requested without injury to prior water rights. \* This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;
- c.  will not or  will likely to be available within the capacity of the groundwater resource; or
- d.  will, if properly conditioned, avoid injury to existing groundwater rights or to the groundwater resource:
  - i.  The permit should contain condition #(s) 7N (annual measurement condition) and medium water-use reporting;
  - ii.  The permit should be conditioned as indicated in item 2 below.
  - iii.  The permit should contain special condition(s) as indicated in item 3 below;

- B2. a.  **Condition** to allow groundwater production from no deeper than \_\_\_\_\_ ft. below land surface;
- b.  **Condition** to allow groundwater production from no shallower than \_\_\_\_\_ ft. below land surface;
- c.  **Condition** to allow groundwater production only from the \_\_\_\_\_ groundwater reservoir between approximately \_\_\_\_\_ ft. and \_\_\_\_\_ ft. below land surface;
- d.  **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

**Describe injury** –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): \_\_\_\_\_

- B3. **Groundwater availability remarks:** The proposed POA (Well 1) will produce water from the sands and gravels of the Willamette aquifer, which is approximately 60 to 80 feet thick in the area of interest. The Willamette aquifer in this area is overlain by approximately 100 feet of fine-grained sediments (the “Willamette silt”) (Woodward et al, 1998). For nearby wells completed to depths of 300 feet below land surface (bls) or less, reported yields range from 2 to 1,400 gpm with a median of 40 gpm (OWRD Well Log Query Report). At least 106 nearby water wells (approximately 23 percent of the queried sample set) have reported yields equal to or greater than the well specific rate of 170 gpm requested for the proposed Well 1.

Data from nearby observation wells indicate very modest declines in the seasonal high water level, typically on the order of 5 feet over roughly the past 50 years (see attached hydrographs). However, even at the seasonal low water level, there still appears to be approximately 100 feet or more of available hydraulic head in Willamette aquifer observation wells in this area, indicating that the aquifer is not likely in immediate danger of over exploitation.

The nearest groundwater right to the proposed POA is Certificate 55722 (POA/Well Log ID MARI 3935), located approximately 745 feet to the west-southwest of the proposed POA. However, the POA and POU for Certificate 55722 are both within the same tax lot (Marion County lot 06 2W 11 100) as the proposed POA and POU for application G-18701. Therefore, it is assumed that Certificate 55722/MARI 3935 is owned by the Applicant and that interference between the proposed Well 1 and MARI 3935 is not of particular concern from the standpoint of injury.

The nearest groundwater right on an adjacent tax lot to the proposed POA is Certificate 56378 (POA/Well Log ID MARI 3936), located approximately 1,175 feet to the southeast of the proposed POA.

Based on the very modest declines in seasonal high water levels and the limited seasonal fluctuations between high and low water levels recorded in nearby observation wells despite the significant number of nearby water wells with reported yields equal to or greater than the well specific rate requested for the proposed Well 1, it would appear that there is only a marginal



potential for significant injury to senior groundwater rights or exempt well users from the allocation requested in this application.

Reported yields from nearby, similar wells indicate that the local alluvial aquifer should be able to support the proposed use and rate. If a new permit is granted, the following conditions are recommended to protect the heavily-utilized groundwater resource in this area:

- 7N: annual measurement condition
- Medium water-use reporting



**C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040****C1. 690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
<b>1</b>	<b>Alluvium</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Basis for aquifer confinement evaluation:** Water Well Reports for wells completed near the proposed Well 1 generally indicate saturated sands and gravels beginning around 100 feet bls and extending to as much as 290 feet bls, but more typically to around 210 feet bls (OWRD Well Log Query Report). These sands and gravels are considered part of the Willamette aquifer, which the USGS estimates at up to 80 feet thick near the proposed POA/POU (Gannett and Caldwell, 1998). Water well logs indicate fine-grained sediments (clays and silt) from the top of the saturated sands and gravels to near land surface (OWRD Well Log Query Report). These fine-grained sediments are referred to as the Willamette silt by the USGS and estimated at up to approximately 100 feet thick (Gannett and Caldwell, 1998). The Willamette Silt acts as a confining unit for the Willamette Aquifer (Woodward et al, 1998). Static water levels noted in the Water Well Reports are above the top of the shallowest saturated sands and gravels by as little as 10 feet and as much as 140 feet, with a median of approximately 60 feet, indicating confined conditions.

**C2. 690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected?			Potential for Subst. Interfer. Assumed?	
						YES	NO	ASSUMED	YES	NO
<b>1</b>	<b>1</b>	<b>Carnes Creek</b>	<b>~150<sup>a</sup></b>	<b>150-140<sup>b</sup></b>	<b>1,740</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Basis for aquifer hydraulic connection evaluation:**

<sup>a</sup> Approximate groundwater elevation from Gannett and Caldwell (1998).

<sup>b</sup> Surface water elevations estimated as land surface elevations along stream reach nearest to proposed Well 1 (USGS, 2013, 2017).

Hydraulic connection was only determined for nearby perennial streams. Perennial stream designations were determined from USGS topographic maps (USGS, 2017).

SW1: The estimated groundwater elevation at the proposed Well 1 location is equal to or above the estimated surface water elevation for Carnes Creek along its nearest perennial reach. Although nearby water well logs and USGS studies indicate as much as 100 feet of fine-grained sediments between land surface and the water-bearing zones of the Willamette Aquifer, Carnes Creek may have incised into a significant portion of these fine-grained sediments based on its elevation relative to the surrounding land surface (approximately 180 feet msl) (OWRD Well Log Query Report; Gannett and Caldwell, 1998; USGS, 2017). Furthermore, USGS interpretations of the static water level (potentiometric surface) in the Willamette Aquifer may indicate a gaining stream condition in the lower portion of Carnes Creek (Gannett and Caldwell, 1998). The similarity of the estimated groundwater and surface water elevations and the nature of the USGS interpretation of the potentiometric surface are sufficient to assume some degree of hydraulic connection, albeit a potentially inefficient one due to the intervening fine-grained sediments.

**Water Availability Basin the well(s) are located within:** SW1: PUDDING R > MOLALLA R – AB MILL CR



C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% natural flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked  box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	67.3	<input type="checkbox"/>	<<25%	<input type="checkbox"/>

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells.** Otherwise same evaluation and limitations apply as in C3a above.

SW #	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
N/A	<input type="checkbox"/>			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>

**Comments:** C3a: Potential depletion of SW1 (Carnes Creek) was estimated using the Hunt 2003 analytical stream depletion model (Hunt, 2003). Hydraulic parameters used for the model were derived either from regional data or studies of the hydrogeologic regime (OWRD Well Log Query Report; Conlon et al, 2003, 2005; Iverson, 2002; Woodward et al, 1998), or are within a typical range of values for the parameter within the hydrogeologic regime (Freeze and Cherry, 1979; Domenico and Mifflin, 1965). See attached "Stream Depletion Analysis Results (SW1)" for the specific parameters used in the analysis.

The Hunt 2003 analytical model results indicate that depletion of SW1 is anticipated to be much less than 25% of the well discharge after 30 days of pumping.

C3b: Not applicable.

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
(A) = Total Interf.													
(B) = 80 % Nat. Q													
(C) = 1 % Nat. Q													
(D) = (A) > (C)													
(E) = (A / B) x 100		%	%	%	%	%	%	%	%	%	%	%	%

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.



**Basis for impact evaluation:** Due to the negligible projected interference with Carnes Creek, other surface water sources at greater distances from the proposed Well 1 were not assessed.

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

- C5.  **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or groundwater use under this permit can be regulated if it is found to substantially interfere with surface water:
- i.  The permit should contain condition #(s) \_\_\_\_\_;
  - ii.  The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:**

C1 (OAR 690-09-040(1)): The proposed POA ("Well 1") will produce groundwater from a confined alluvial aquifer.

C2 (OAR 690-09-040(2)(3)): Well 1 is determined to be connected to SW1 (Carnes Creek), a perennial stream tributary to the Little Pudding River, tributary to the Pudding River.

C3a (690-09-040(4)): The Hunt 2003 analytical model results indicate that depletion of SW1 is expected to be substantially less than 1% of the well discharge after 30 days of continuous pumping.

C3b (690-09-040(4)): Not applicable.

C4a (690-09-040(5)): Not assessed due to negligible interference determined in C3a.

**References Used:**

Application file: G-18701

Conlon, T.D., Wozniak, K.C., Woodcock, D., Herrera, N.B., Fisher, B.J., Morgan, D.S., Lee, K.K., and Hinkle, S.R., 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5168.

Conlon, T.D., Lee, K.K., and Risley, J.R., 2003, Heat tracing in streams in the central Willamette Basin, Oregon, in Stonestrom, D.A. and Constantz, Jim, eds., Heat as a tool for studying the movement of groundwater near streams: U.S. Geological Survey Circular 1260, chapter 5, p. 29-34.

Domenico, P.A. and Mifflin, 1965, Water from low-permeability sediments and land subsidence: Water Resource Research, v. 1, no. 4, p. 563-576.

Freeze, R.A. and Cherry, J.A., 1979, Groundwater, Prentice Hall, Englewood Cliffs, New Jersey, 604 p.

Gannett, M.W. and Caldwell, R., 1998, Geologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A, 32 p.

Hunt, B., 2003, Unsteady stream depletion when pumping from semiconfined aquifer: Journal of Hydrologic Engineering, January/February, 2003.

Iverson, J., 2002, Investigation of the hydraulic, physical, and chemical buffering capacity of Missoula flood deposits for water quality and supply in the Willamette Valley of Oregon: Unpublished M.S. thesis, Oregon State University, 147 p.

United States Geological Survey, 2013, National Elevation Dataset (NED) [DEM geospatial data]. 1/9<sup>th</sup> arc-second, updated 2013.

United States Geological Survey, 2017, Gervais quadrangle, Oregon [map], 1:24,000, 7.5 minute topographic series, U.S. Department of the Interior, Reston, Virginia.

Watershed Sciences, 2009, LIDAR remote sensing data collection, Department of Geology and Mineral Industries, Willamette Valley Phase I, Oregon, Portland, OR, December 21.



Woodward, D.G., Gannett, M.W., and Vaccaro, J.J., 1998, Hydrogeologic framework of the Willamette Lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B, 82 p.



**D. WELL CONSTRUCTION, OAR 690-200**

D1. Well #: \_\_\_\_\_ Logid: \_\_\_\_\_

D2. **THE WELL does not appear to meet current well construction standards based upon:**

- a.  review of the well log;
- b.  field inspection by \_\_\_\_\_;
- c.  report of CWRE \_\_\_\_\_;
- d.  other: (specify) \_\_\_\_\_

D3. **THE WELL construction deficiency or other comment is described as follows:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

D4.  **Route to the Well Construction and Compliance Section for a review of existing well construction.**



Water Availability Tables

## Water Availability Analysis

### Detailed Reports

PUDDING R > MOLALLA R - AB MILL CR  
WILLAMETTE BASIN

Water Availability as of 11/30/2018

Watershed ID #: 151 [\(Map\)](#)  
Date: 11/30/2018

Exceedance Level: 80%   
Time: 4:25 PM

- Water Availability Calculation
  - Consumptive Uses and Storages
  - Instream Flow Requirements
  - Reservations
- Water Rights
  - Watershed Characteristics

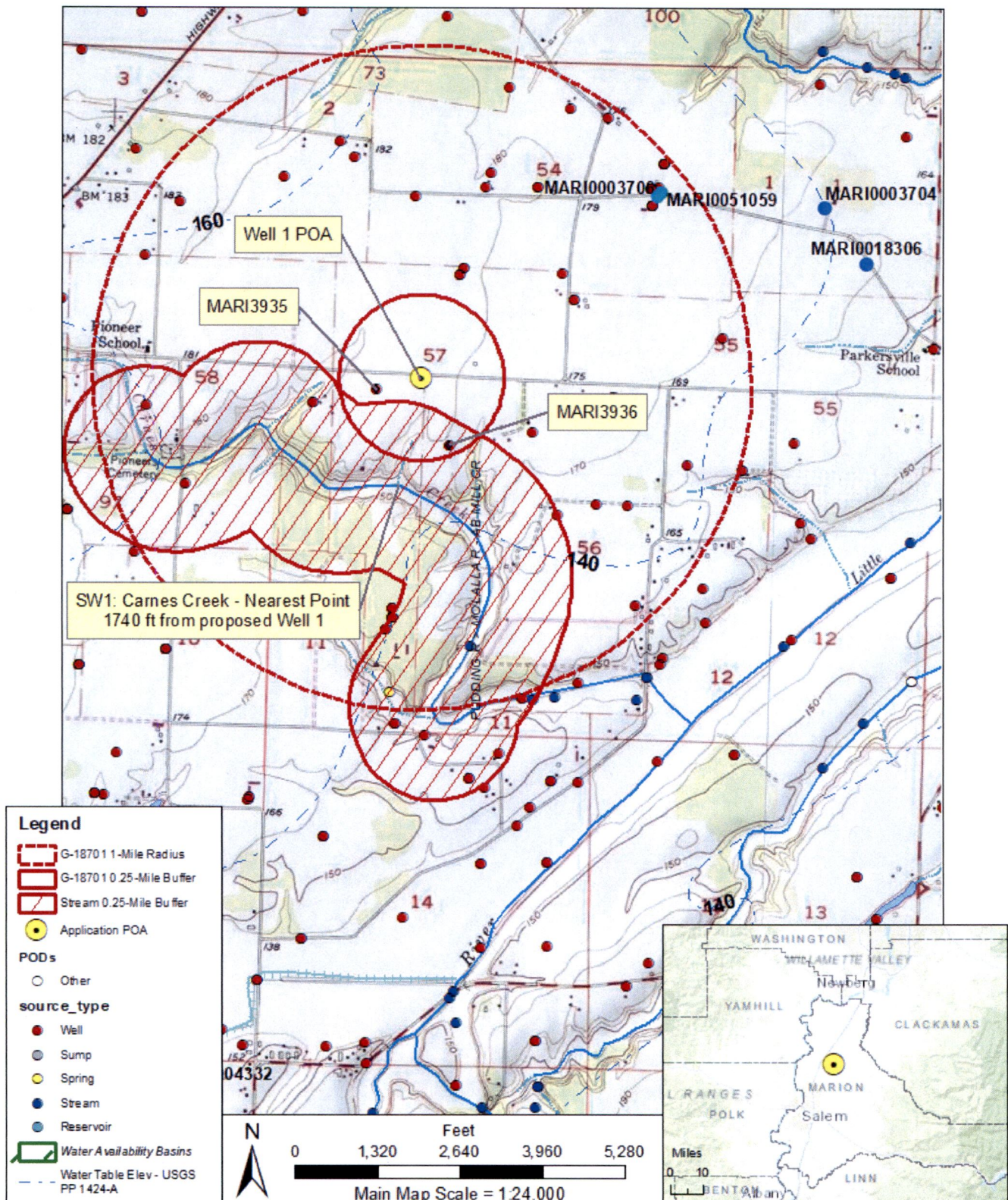
### Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second  
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	1,040.00	124.00	916.00	0.00	36.00	880.00
FEB	1,180.00	114.00	1,070.00	0.00	36.00	1,030.00
MAR	1,010.00	75.80	934.00	0.00	36.00	898.00
APR	787.00	51.60	735.00	0.00	36.00	699.00
MAY	425.00	49.10	376.00	0.00	36.00	340.00
JUN	224.00	70.20	154.00	0.00	36.00	118.00
JUL	109.00	111.00	-1.52	0.00	36.00	-37.50
AUG	71.00	90.60	-19.60	0.00	36.00	-55.60
SEP	67.30	51.60	15.70	0.00	36.00	-20.30
OCT	91.60	11.00	80.60	0.00	36.00	44.60
NOV	363.00	48.30	315.00	0.00	36.00	279.00
DEC	957.00	118.00	839.00	0.00	36.00	803.00
ANN	706,000.00	55,200.00	651,000.00	0.00	26,100.00	627,000.00

Well Location Map

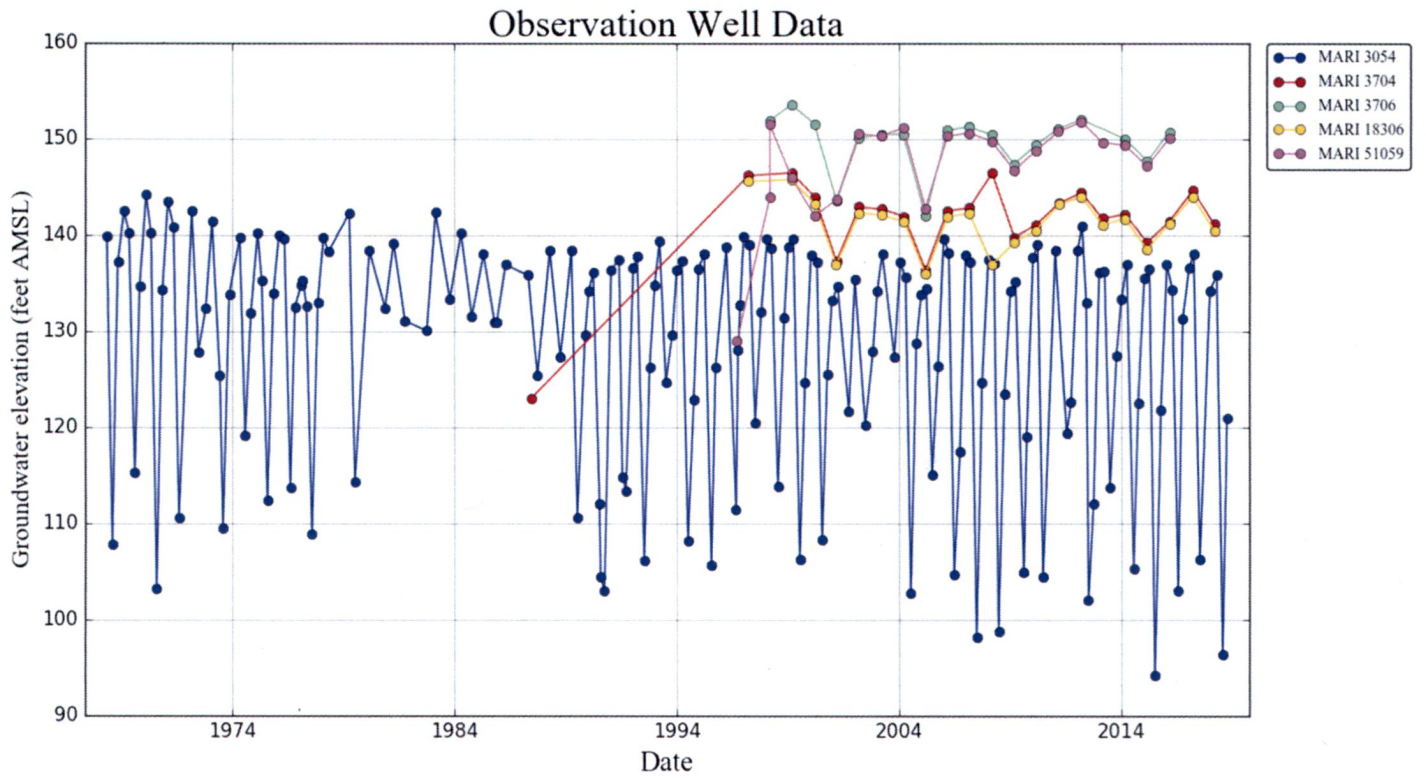
### G-18701 Wells, Harrison, Thrush, and Traudt



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, OpenStreetMap contributors, and the GIS User Community  
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Water-Level Trends in Nearby Wells



Stream Depletion Analysis Results (SW1)

Application type:	G
Application number:	18701
Well number:	1
Stream Number:	1
Pumping rate (cfs):	0.379
Pumping duration (days):	245.0

Parameter	Symbol	Scenario 1	Scenario 2	Scenario 3	Units
Distance from well to stream	a	1740.0	1740.0	1740.0	ft
Aquifer transmissivity	T	2000.0	2700.0	6800.0	ft <sup>2</sup> /day
Aquifer storativity	S	0.005	0.001	0.0005	-
Aquitard vertical hydraulic conductivity	Kva	0.001	0.005	0.01	ft/day
Aquitard saturated thickness	ba	40.0	60.0	80.0	ft
Aquitard thickness below stream	babs	60.0	50.0	40.0	ft
Aquitard specific yield	Sya	0.33	0.2	0.06	-
Stream width	ws	5.0	5.0	5.0	ft

Stream depletion for Scenario 2:

Days	10	30	60	90	120	150	180	210	240	270	300	330	360
Depletion (%)	0	0	0	0	0	0	0	0	0	0	0	0	0
Depletion (cfs)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

